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In-vitro interactions of Lawsonia intracellularis with cultured enterocytes.

McOrist S, Mackie RA, Lawson GH, Smith DG.

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Strains of the obligately intracellular bacterium Lawsonia intracellularis, the etiologic agent of porcine proliferative enteropathy, were co-cultured in rat enterocyte cell cultures (IEC-18) and examined ultrastructurally. No regular surface arrays typical of surface or S-layers were visible on any bacterial strain, with or without Triton-X-100 detergent treatment. In separate experiments, there was no difference in the ability of L. intracellularis to attach and enter enterocytes with or without the presence of added bovine plasma fibronectin, or the peptide Arg-Gly-Ser. Interestingly, there was an increase in the invasiveness of L. intracellularis in the presence of the peptide Arg-Gly-Asp (RGD), in a dose-related manner. A reduction was observed in the ability of L. intracellularis to invade enterocytes in the presence of monovalent fragments of IgG monoclonal antibodies to an outer surface component of L. intracellularis. This neutralization showed an antibody concentration-dependent titration effect and was not apparent with co-cultures incorporating control antibodies. The exact nature of ligand and cell receptor interactions for L. intracellularis remain to be determined.

PMID: 9100338 [PubMed - indexed for MEDLINE]

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1: Vet Microbiol 2003 Feb 2;91(2-3):135-45

Onset and duration of fecal shedding, cell-mediated and humoral immune responses in pigs after challenge with a pathogenic isolate or attenuated vaccine strain of Lawsonia intracellularis.

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Little is known about the humoral and, especially, cell-mediated immune response in pigs exposed to Lawsonia intracellularis. The objectives of this study were to investigate the onset and duration of fecal shedding, cell-mediated and humoral immune responses in pigs after challenge with a pathogenic isolate or a commercial live vaccine strain of L. intracellularis. Twenty-four 5-week-old pigs were exposed to 4.4x10(9) organisms of a pathogenic L. intracellularis isolate PHE/MN1-00 (10 pigs), a L. intracellularis live attenuated vaccine strain (10 pigs) or sham inoculum (4 pigs). Fecal, serum and whole blood samples were collected from all animals before exposure and weekly up to 13 weeks post inoculation and tested by PCR, immunoperoxidase monolayer assay serology and an interferon-gamma assay, respectively. One animal from each group was euthanized on day 22 post exposure to confirm infection. Humoral and cell-mediated immune responses were initially detected 2 weeks after exposure in pigs challenged with the pathogenic isolate, and 5 and 4 weeks, respectively, in pigs exposed to the modified-live vaccine group. Humoral and cell-mediated immune responses were still detected in some pigs from both L. intracellularis exposed groups 13 weeks after exposure. Fecal shedding was initially detected 1 week and lasted, intermittently, 12 weeks post exposure in pigs challenged with the pathogenic isolate, while fecal shedding was first detected 2 weeks and lasted, also intermittently, 9 weeks after exposure to the vaccine. In summary, both pathogenic isolate challenged and vaccine exposed pigs demonstrated long-term shedding of and immune responses to L. intracellularis.

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